

## 1.6S PP SPUNBOND NONWOVEN PRODUCTION LINE

### I . Application

This equipment is suitable for the production of spunbond nonwovens with a variety of colors and different properties using PP chips as main material mixed with master batch, antioxidant, anti-pilling agent and flame retardant.

### II. Design Basis

#### 1. Project data

Raw material: Polypropylene chips (Melt index: 30-40g/10min, with variation not more than 1% for each batch; Melt point: 166°C; Ash content: < 0.15-0.25%)

Annual output: 2000 tons (say 8,000hours based on 2.2denier single filament )

Extruder size:  $\phi$  130×32

Max. winding diameter: 1000mm

Process speed: 10-130m/min

Installed power: approx. 700kW

#### 2. Product specifications:

Web width: 1600mm

Single filament titer: 1.8-2.2 denier

Web weight: 10-150g/m<sup>2</sup>

### III. Process flow:

Feeding (suction, dosing and mixing)→melting and extruding (with recycle extruder)→filtering→metering→spinning→quenching→air drawing→forming→calendering→winding→slitting

### IV. Description of unit machines

#### 1. Dosing and mixing system

##### 1.1 Function

Chips are transported by a suction system from the ground to the dosing and mixing system on the third floor. Main material and auxiliary materials can be prepared as per a certain ratio. The whole system consists of the following:

Consisting of a main material tank, two auxiliary tanks, a mixing tank, a suction device, a metal detector, complete with an alarm unit for low and high chip levels, automatic control of feeding.

The main material is suctioned automatically with the ancillary material filled manually. Dosing screws are used for filling proportionally.

## 1.2 Technical data

Max. feeding capacity for main material: 480kg/hr

Volume of storage hopper: 0.6m<sup>3</sup>

Max. mixed components: 3

## 2. Extruder

### 2.1 Function

Used to melt and extrude PP chips mixed with master batches and additives such as antioxidant, anti-pilling agent and flame retardant agent, including chip inlet, automatic temperature controls, cooling system, alarm system for all the heating zones with temperature meter, solid relay and pt100 platinum resistance.

### 2.2 Technical data

Max. extruding capacity: 350kg/hr

Diameter of screw: 130mm

L/D: 32

No. of heating zones: 7

## 3. Spinning machine,

### 3.1 Function

The melt coming from the extruder becomes filaments after passing through the filter, melt distribution line, metering pump and spin packs. It also includes automatic heating and insulating system, pressure indication and control system behind filtering screen.

### 3.2 Technical data

3.2.1 Output: 2000 tons/year

**Single filament titer: 1.6-2.2denier**

**Web weight: 10-150 g/m<sup>2</sup>**

### **3.2.2 Melt prefilter**

**Filtering precision: 60  $\mu$  m**

### **3.2.3 Metering pump and its drive**

**Metering capacity: 200cm<sup>3</sup>/r**

**Driven by an inverter-controlled synchronous motor**

### **3.2.4 Spinning beam**

**With electrical heating**

**No. of heating zones: 13**

### **3.2.5 Melt distribution line**

**With electrical heating**

### **3.2.6 Spin pack**

**No. of holes : 8782**

**Hole diameter :  $\Phi$ 0.5mm**

**L/D ratio : 5**

**Material for spinneret and distribution plate: heat-resistance SS**

### **3.2.7 Monomer suction device**

**Drag motor: 2.2kW**

## **4 Edge recycle extruder**

### **4.1 Function**

**Used for recovery of edges, including A.C. regulating motor for recovery screw and complete temperature control system composed by temperature meter for each heating zone, solid relay and pt100 platinum resistance.**

### **4.2 Technical data**

**Screw size:  $\phi$  105 x 15**

## **5 Quenching and drawing system**

## **5.1 Function**

Used for the cooling and drawing of filaments, including a quenching chamber, upper drawing channel, middle drawing channel, lower drawing channel, and diffusion air duct. Double-side quenching is employed.

## **5.2 Technical data**

Nominal working width: 1600mm

## **6 Web former**

### **6.1 Function**

Used as carrier for the drawn fiber webs, including a drive system for web forming belt, a suction channel device, a sealing device, an automatic correcting device, belt tensioning device, a frame and a pre-pressing roller

### **6.2 Technical data**

Max. mechanical speed: 150m/min

Process speed: 10-130m/min

Air permeating ratio of web forming belt: 7000-8000m<sup>3</sup>/h.m<sup>2</sup>

## **7 Calender**

### **7.1 Function**

Used for bonding formed webs by pressure and heating.

### **7.2 Technical data**

Process speed: 10-130m/min

Working width: 2000mm

Type of rollers: engraved upper roller and plain lower roller

## **8 Winder**

### **8.1 Function**

Used for winding the bonded webs on rolls.

### **8.2 Technical data**

**Process speed: 10-130m/min**

**Working width: 2000mm**

**Max. winding diameter: 1000mm**

## **10 Electrical Control**

**10.1 Controlled by SIEMENS PLC and touch screen.**

**10.2 Inverters to be Siemens**

## **V. ENGINEERING BOUNDARY AND SCOPE OF SUPPLY**

### **Main machines**

<b>1. Suction, dosing and mixing device</b>			<b>1set</b>
<b>2. Extruder</b>			
<b>1set</b>			
<b>3. Spinning machine</b>			<b>1set</b>
<b>4. Quenching and drawing system</b>			<b>1set</b>
<b>5. Edge recycle extruder</b>		<b>1set</b>	
<b>6. Web former</b>			<b>1set</b>
<b>7. Calender</b>	<b>1set</b>		
<b>8. Winder</b>		<b>1set</b>	
<b>9. Slitter</b>			<b>1set</b>
<b>10. Steel frame for main machine</b>		<b>1set</b>	
<b>11. Air Conditioner (with Carrier chiller)</b>		<b>1set</b>	
<b>12. Electrical control system (Without cable and cable tray)</b>		<b>1set</b>	

### **Auxiliary units**

<b>13. Pack oven</b>			<b>1set</b>
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|---|--------------|-------------|
| <b>14. Pack ultrasonic cleaning machine</b>                       |              | <b>1set</b> |
| <b>15. Cooling tower</b>  | <b>1 set</b> |             |
| <b>16. Air compressor</b>   | <b>1 pc</b>  |             |
| <b>17. Lab equipment (Weight, Tensile Strength and Thickness)</b> | <b>1 set</b> |             |
| <b>18. Crane for spinneret.</b>                                   | <b>1 pc</b>  |             |
| <b>19. Air storage tank.</b>                                      | <b>1 pc</b>  |             |

## Spare Parts

Code	Name	Qty
	Filter Screen	750
High Strength Bolt for Spinneret	Made in China	100
Position Pin for Spinneret	Made in China	10
Sealing Pad for Melt Distribution Line		2 pieces for each type
Electric Heating Stick		20 pieces for spinning beam 1 piece for the other each type
Filter Screen in Spin Pack		25 pieces
Spinneret		1 set
Metering Pump		1 pc
Metering Pump motor		1 pc
Safety pin for metering pump drive		20 pcs
Honeycomb board		1 set (2 pieces)
All flexible connection		1 set each type
Pt100 Sensor		10% each type (minimum 1)
Electrical panel equipment (lower voltage Equipment)		10% each type (minimum 1)
Conveyor belt		1 pc
Forming device pressing roll bearing		1 pair
Winder shafts		2 pcs

## **VI Exclusion / Buyer's supply**

- 1. Air duct, insulation and its accessories**
- 2. Water pipe, insulation and its accessories**
- 3. Oil pipe, insulation and its accessories**
- 4. Air compressor pipe, , insulation and its accessories**
- 5. Electric supply 415V, 50Hz.**
- 6. Crane product lifting (3-5 tons)**
- 7. Cable and cable tray**
- 8. Distribution panel between control cabinet and transformer**
- 9. Arrange to construct foundation and to provide foundation bolts.**
- 10. Some other items Buyer should also prepare:**
  - 10.1 A water pool: 30-40m<sup>3</sup> (used for the circulation of quenching water);**
  - 10.2 Electronic balance: 0-200g;**
  - 10.3 Balance: 0-150Kg;**
  - 10.4 Plastic packing bag;**
  - 10.5 Paper tube;**
  - 10.6 Hoist: 15t (used temporarily for erection);**
  - 10.7 Normal tools for fitter: wrench, spanner and so on;**
  - 10.8 Tools for technician: pincers, knife and so on;**
  - 10.9 MoS2 high temperature lubricant;**
  - 10.10 Lubricating oil for various reducers;**
  - 10.11 Silicone oil;**
  - 10.12 Electrical welding machine**
  - 10.13 Heat-transfer oil for the heating of thermal calender**
  - 10.14 Other fittings and civil facility**